

IXODES NEOTOMAE, A NEW SPECIES FROM CALIFORNIA
(ACARINA: IXODIDAE)¹

BY R. A. COOLEY

Senior Entomologist, United States Public Health Service

A detailed study of numerous specimens of *Ixodes* which have the auriculae in the shape of a pair of long, curved horns shows that the form in California occurring mainly on the wood rat (*Neotoma*) differs from *I. diversifossus* Neumann, 1899 taken from the raccoon (*Procyon lotor*) in New Mexico, and *I. spinipalpis* Nuttall, 1916 which is found mainly on rabbits in the Western States. The California species is described below.

Ixodes neotomae Cooley, new species

Female

Body. No unfed specimens are available. Engorged females may reach at least 6.5 x 4.0² and are oval, wider and thicker (dorso-ventrally) behind.

Capitulum. Length (from tips of cornua to tip of hypostome) from 0.66 to 0.78; width of basis, 0.36 to 0.40. Lateral margins straight or a little curved, mildly converging posteriorly. Posterior margin straight, salient, and at about the same level as the distinct, small cornua. Surface mildly and evenly convex, faintly shagreened, impunctate, and without hairs. Porose areas well separated, superficial or faintly depressed. Palpi long, with lateral profile lines straight, curved on median side, widest at about the middle. Surface nearly smooth, shining; hairs few and short excepting a few long ones on the median side at the base. Combined length of articles 2 and 3 about 0.60, greatest width 0.158.

In ventral view basis is slightly waisted at the middle, posterior corners rounded and the posterior edge nearly straight and salient. Transverse suture faint or absent. Auriculae as long, curved horns which are directed downward and backward. Surface smooth, shagreened and shining. Palpi with their inner faces flattened. Article 1 with a distinct pointed ventral spur and usually with two fine hairs. Several long, fine hairs arising from the ventral edge of the palpi.

Hypostome. Long and narrow with the denticles 4|4, 3|3, and at the base 2|2; denticles long, narrow, and sharp, progressively smaller toward the middle line. Length about 0.405.

¹ From the Rocky Mountain Laboratory (Hamilton, Montana) of the Division of Infectious Diseases of the National Institute of Health.

² All measurements in this paper are in millimeters.

Scutum. Length from 1.05 to 1.17, width 0.78 to 0.87. Oval, very broadly rounded behind. Lateral carinae as rounded elevations which may be nearly negligible in some specimens. Cervical grooves divergent, moderate or faint, and usually absent in the anterior area. Punctations distinct, larger, and more numerous in the median posterior area, few or absent outside of the lateral carinae. Surface shagreened and shining. Hairs long and fine.

Legs. Moderate in length and size, and with the ventral hairs long. Length of tarsus I, 0.48; metatarsus, 0.24. Length of tarsus IV, 0.39; metatarsus, 0.30.

Coxae. Flattened, shagreened, and with long fine hairs. Posterior margins salient posteriorly. Internal spur on I long; absent on II, III, and IV. External spur on I distinct but short, those on II, III, and IV progressively smaller and that on IV very small.

Spiracular plate. Nearly circular with the slightly longer axis transverse. Marginal goblets rectangular, medians circular and larger. Length 0.17, width 0.147.

Sexual aperture. At the level of the posterior edges of coxae III.

Male

Body. Length 1.02, width 0.72. Oval, widest at about the middle.

Capitulum. Length 0.326; width of basis 0.20. Sides nearly straight, converging posteriorly. Cornua distinct, small and at the level of the straight, salient posterior edge. Surface nearly flat, shagreened, impunctate, and without hairs. Palpi with their lateral profile lines nearly straight, median sides curved, widest well back of the middle. Surface smooth and faintly shining, depressed near their median margins. Hairs few and short excepting a few long ones on the median side at the base. Combined length of 2 and 3, 0.22; width 0.105. In ventral view basis is broad, rounded and salient behind; auriculae as short, pointed or rounded lateral extensions at the same level as the ventral surface. Palpi flattened on their inner faces. Article 1 with sharp ventral edge which is continuous with the ventral edge of articles 2 and 3. A few long hairs present on ventral edge of articles 2 and 3.

Hypostome. Large, mildly notched apically. Lateral denticles large and sharp, about four in number on each side, with one large, rounded tooth directed behind. Median denticles as diagonal crenulations or very faint teeth. Length about 0.216.

Scutum. Oval, convex, about equally declivitous in all submarginal areas. Lateral carinae absent. Cervical grooves distinct but mild, divergent behind and reaching about half the length of the scutum. Pseudoscutum distinguishable mainly by its darker color; reaching about half the scutal length. Punctations distinct, smaller on the pseudoscutum. Surface shagreened, shining. Hairs long and fine.

Legs. Essentially as in the female. Length of tarsus I, 0.29; metatarsus, 0.144. Length of tarsus IV, 0.27; metatarsus 0.144.

Coxae. Essentially as in the female.

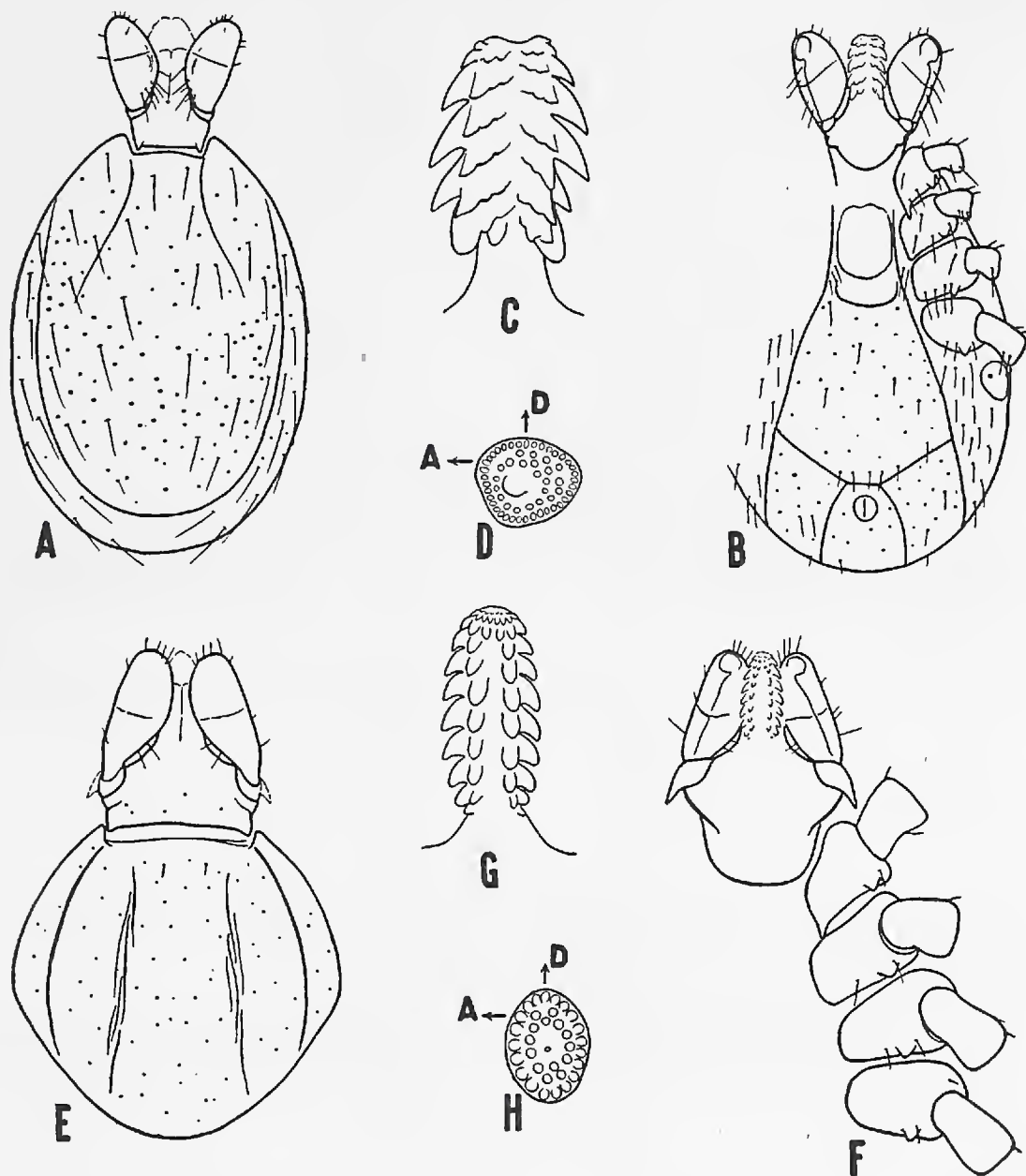


Fig. 1. *Ixodes neotomae* Cooley. A. Capitulum and scutum, male, dorsal view. B. Capitulum, coxae and ventral plates, ventral view. C. Hypostome, male. D. Spiracular plate, male. E. Capitulum and scutum of the nymph, dorsal view. F. Capitulum and coxae of nymph, ventral view. G. Hypostome, nymph. H. Spiracular plate, nymph.

Ventral plates. Median plate about three times as long as the anal plate. Adanals much wider in front. Anal plate much wider behind. Punctations on median and adanals small but distinct; absent or few and small on anal plate. Hairs few, fine and of moderate length.

Spiracular plate. Small, oval with the longer axis longitudinal.

Goblets about equal in the marginal and median fields, those in the median field few in number. Length 0.125, width 0.96.

Sexual aperture. At the level of the intervals between coxae II and III.

Nymph

Capitulum. Length (from tips of cornua to tip of hypostome), 0.34; width of basis, 0.29. Basis short and broad, flattened on top. Cornua short but distinct, a little elevated over the level of the posterior edge which is nearly straight, salient. Surface faintly shagreened, shining, faintly punctate and without hairs. Palpi short, with the lateral profile lines straight, median profile lines evenly curved. Surface smooth and shining; hairs few, short and fine. Combined length of articles 2 and 3, 0.15.

In ventral view basis is broad in front, narrow, evenly rounded behind, and slightly waisted at the middle. Transverse suture not visible. Auriculae only suggested as mild extensions at the same level as the ventral wall of the capitulum. Surface smooth, shining, impunctate and without hairs. Palpi set far away from the mouth parts, flattened medially. Article I with a conspicuous retrograde spur.

Hypostome. Bluntly rounded apically. Dentition 2|2 for most of the length. Laterals larger and only a little pointed; medians smaller and rounded. Length about 0.187.

Scutum. Length 0.60, width 0.63. Lateral carinae very distinct, more declivitous on the median side, the two limiting a median oval depressed area. Cervical grooves deep, long, nearly parallel, and reaching nearly to the anterior and posterior ends of the scutum. Surface faintly shagreened, shining, and with a few small punctations. Hairs negligible.

Legs. Essentially as in the adult.

Coxae. Much as with the adults but with internal spur on coxae I shorter.

Spiracular plate. Oval, with the marginal and median goblets of about equal size. Length 0.096, width 0.067.

Holotype. Two females (19430) from *Neotoma f. microtis*, November 5, 1941, LOS ANGELES COUNTY, CALIFORNIA.

Allotype. One male (16831) from *Sylvilagus bachmani cinerascens*, October 7, 1922, LA JOLLA, SAN DIEGO COUNTY, CALIFORNIA.

Paratypes. One female (15970), *Sylvilagus bachmani cinerascens*, September 17, 1922, ANGELS CAMP, CALAVERAS COUNTY; one female (15811), *Neotoma fuscipes*, April 17, 1939, MONTE-REY COUNTY, CALIFORNIA; one nymph (17948), *Neotoma fuscipes*, July 13, 1940, HASTINGS NATURAL HISTORY RESERVATION, CALIFORNIA; one female (12943), deer mouse, June 30, 1936, OAKLAND HILLS, OAKLAND, CALIFORNIA; three females (13064),

Sylvilagus sp., February 7, 1937, GOPHER CANYON, VISTA, CALIFORNIA.

Holotype, allotype, and paratypes 17948 deposited in the collections of the Rocky Mountain Laboratory, Hamilton, Montana.

Paratype 13064 placed in the United States National Museum; paratype 15811 in the Division of Entomology and Parasitology, University of California, Berkeley, California, paratype 15970 in

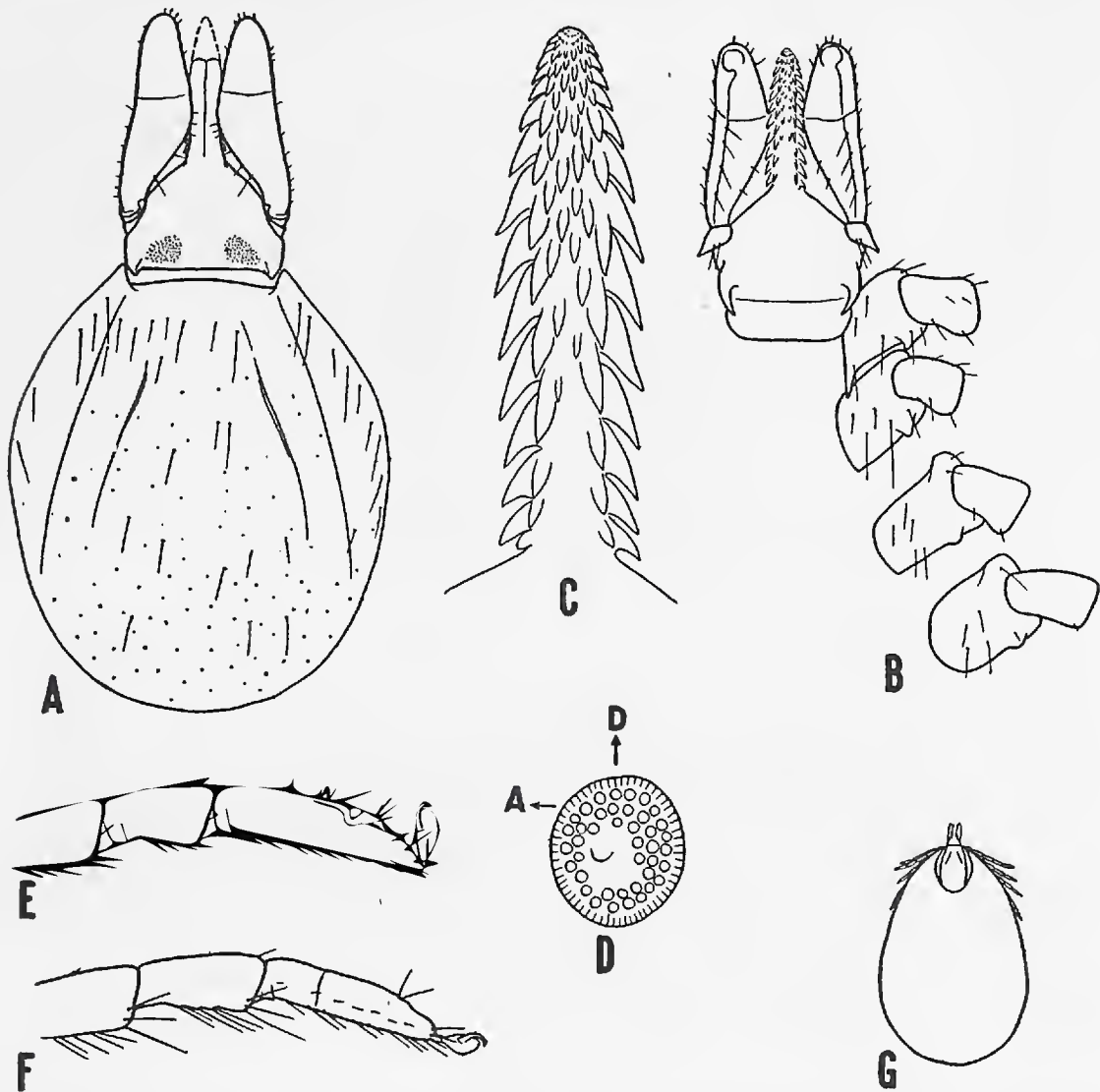


Fig. 2. *Ixodes neotomae* Cooley. A. Capitulum and scutum, female, dorsal view. B. Capitulum and coxae, female, ventral view. C. Hypostome, female. D. Spiracular plate. E. Leg I, female. F. Leg IV, female. G. Engorged female.

the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts.

Females of *neotomae* are close to those of *spinipalpis* but can be separated by the narrower hypostome in *neotomae* which has longer, sharper denticles; *spinipalpis* has the sexual aperture between coxae IV, while in *neotomae* it is at the level of the

intervals between coxae III and IV. Adults, especially the males, are larger in *spinipalpis*.

The nymphs are very distinct, those of *spinipalpis* having the hypostome wider with the lateral teeth more pointed, and with the dentition 3|3 for nearly half the length and then 2|2, while in *neotomae* the hypostome is more rounded apically, with denticles more rounded; dentition 2|2 from near the tip to the base. The nymphal scutum in *neotoma* is nearly circular and has distinct curved lateral carinae, while in *spinipalpis* it is a little longer than wide and has shorter, nearly straight lateral carinae.

Both *neotomae* and *spinipalpis* are close to *diversifossus* of which no nymphs are known. *I. diversifossus* is distinctly larger and has the larger and heavier auriculae placed farther apart and has no definite ventral horn on palpal article 1.

A NEW SPECIES OF ZACOTUS

(Coleoptera, Carabidae)

BY F. W. NUNENMACHER

Piedmont, California

Zacotus fredericki Nunenmacher, new species

Elongate narrow and convex; metallic green, shining, under surface and legs shining black. Head a little smaller than prothorax, surface rugose, the longitudinal impressions clearly outlined; epistoma truncate, suture distinct; mandibles black; maxillary palpi stout, last segment truncate at apex; antennae thick, black. Pronotum almost as wide as long, sides arcuate and finely reflexed, surface with transverse rugulae; median stria deep; scutellum short and broad. Elytra twice as long as broad, one-fourth wider than pronotum, sides not quite parallel, a little wider at two-thirds of their length; apex evenly rounded, margins very finely reflexed; flanks with four or five impressed submarginal punctures; stria fine, not punctate; intervals flat, unevenly creased, without dorsal punctures; subscutellar punctures distinct, the short, feeble, and slightly oblique scutellar stria not strongly marked. Anterior tarsi of male dilated spongiöse beneath, inner tibial tooth beyond the middle strong. Length of male, 15 mm., width at two-thirds its length, 4.5 mm.

Holotype male, *allotype* female, and two *paratypes*, collected by the writer in LINCOLN COUNTY, OREGON, on June 8, 1941. The holotype, allotype, and a female paratype remain in the author's collection. A paratype male has been deposited in the collection of Mr. E. R. Leach.

This fine species is dedicated to my son. It may be recognized at once by its metallic green color.